

What is claimed is:

1. A method of assembling multiple electronic components to a circuit board, the method comprising:

securing an electronic component to the circuit board;

5 creating an association between the secured electronic component and an environmental condition recorder;

recording data from the environmental condition recorder, the data indicating exposure of the secured electronic component to an environmental condition over time; and

determining, based on the recorded data, whether the secured electronic component is  
10 suitable for exposure to conditions associated with securing a second electronic component to the circuit board.

2. The method of claim 1 further comprising, for a secured electronic component found suitable, exposing the suitable secured electronic component to conditions associated with  
15 securing a second electronic component to the circuit board.

3. The method of claim 1 further comprising maintaining the association between the secured electronic component and the environmental condition recorder from shortly after securing the electronic component until determining suitability.

20 4. The method of claim 1 wherein the environmental condition recorder is adapted to continually monitor and periodically record an ambient environmental condition.

5. The method of claim 1 wherein the environmental condition recorder is adapted to  
25 automatically record an ambient environmental condition over time.

6. The method of claim 1 wherein the conditions associated with securing a second electronic component to the circuit board comprise exposing the secured electronic component to conditions associated with reflow soldering the second component to the  
30 circuit board.

7. The method of claim 1 wherein the conditions associated with securing the second electronic component to the circuit board comprises exposing the secured electronic component to an elevated temperature.

5 8. The method of claim 1 wherein recording the data from the environmental condition recorder comprises storing data that is indicative of the secured electronic component's exposure to atmospheric moisture content.

9. The method of claim 8 wherein the data indicative of atmospheric moisture content  
10 comprises temperature measurements and percent relative humidity measurements collected by the environmental condition recorder over time.

10. The method of claim 1 wherein creating the association between the secured electronic component and the environmental condition recorder comprises physically  
15 attaching the environmental condition recorder to the circuit board.

11. The method of claim 1 wherein creating the association between the secured electronic component and the environmental condition recorder comprises creating a logical association between the secured electronic component and the environmental condition  
20 recorder in a computer database.

12. The method of claim 1 wherein an identification code is positioned on the circuit board, the identification code providing sufficient information to enable identification of the secured component and the circuit board and wherein creating the association comprises  
25 logically linking, in a computer database, the secured electronic component and the circuit board, based on information provided by scanning the identification code.

13. The method of claim 12 wherein the identification code positioned on the circuit board is based on bar code technology.

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14. The method of claim 12 wherein the identification code is based on radio frequency technology.

15. The method of claim 1 wherein recording the data from the environmental condition recorder comprises recording the data to a memory storage unit within the environmental recorder.

16. The method of claim 15 further comprising accessing the recorded data from the memory storage unit, for the suitability determination over a communication channel.

17. The method of claim 1 wherein recording data from the environmental condition recorder comprises recording data to a memory storage unit that is located external to the environmental condition recorder.

18. The method of claim 1, further comprising estimating a cumulative effect that exposure to the recorded environmental conditions would have on the secured component.

19. The method of claim 18 wherein estimating the cumulative effect that exposure to the recorded environmental conditions would have approximates integrating effects of exposure to the recorded environmental conditions over time.

20. The method of claim 18 wherein estimating the cumulative effect that exposure to the recorded environmental conditions would have comprises referencing industry standard guidelines related to expected total floor life for the secured electronic component under particular environmental conditions.

21. The method of claim 1 wherein the environmental condition recorder comprises:  
a sensing element responsive to an environmental condition;  
a memory storage unit in electronic communication with the sensing element and adapted to store environmental condition data sensed by the sensing element; and

a processing unit in electronic communication with the sensing element and the memory storage unit.

22. The method of claim 21 wherein the processing unit is adapted to record the data  
5 from the environmental condition recorder by periodically sampling the sensing element and electronically storing the sample in the memory storage unit.

23. The method of claim 22 wherein the processing unit is adapted to determine whether  
10 the secured component is suitable for exposure to conditions associated with securing a second electronic component to the circuit board by evaluating the sample, stored in the memory storage unit.

24. A method of securing multiple sets of electronic components to a circuit board, the method comprising:  
15 reflow soldering a first set of electronic components to a circuit board;  
creating an association between the first set of electronic components and an environmental condition recorder;  
collecting environmental exposure data with the environmental condition recorder,  
the environmental exposure data being associated with the first set of electronic components  
20 during consecutive time periods before reflow soldering a second set of electronic components to the circuit board;  
storing the collected data in the environmental condition recorder;  
estimating, with the environmental condition recorder, a cumulative effect of the environmental exposure on each electronic component of the first set, based on the stored  
25 data; and  
evaluating, with the environmental condition recorder, whether each electronic component of the first set is suitable for exposure to environmental conditions associated with reflow soldering the second set of electronic components to the circuit board.

30 25. The method of claim 24 further comprising reflow soldering the second set of electronic components to the circuit board depending on whether each electronic component

of the first set is suitable for exposure to environmental conditions associated with reflow soldering the second set of electronic components to the circuit board.

26. The method of claim 24 wherein the conditions associated with reflow soldering a  
5 second set of electronic components to the circuit board comprise an elevated temperature.

27. The method of claim 24 wherein collecting environmental exposure data comprises collecting temperature measurements and relative humidity measurements.

10 28. The method of claim 24 creating the association comprises attaching the environmental condition recorder to the circuit board.

29. The method of claim 24 wherein creating the association comprises scanning a bar  
code affixed to the circuit board, the bar code identifying each electronic component of the  
15 first set of components secured to the circuit board.

30. The method of claim 24 wherein storing the collected data comprises storing the collected data in a memory storage unit within the environmental condition recorder.

20 31. The method of claim 24 wherein the collected data comprises temperature measurements and relative humidity measurements collected over time and wherein estimating the cumulative effect of the environmental exposure comprises integrating the temperature measurements and relative humidity measurements with respect to time.

25 32. The method of claim 24 wherein evaluating whether each electronic component of the first set is suitable for exposure to environmental conditions associated with reflow soldering the second set of electronic components to the circuit board comprises referencing industry standard guidelines.

30 33. The method of claim 24 wherein collecting the environmental exposure data associated with the first set of electronic components comprises using an environmental

condition recorder to continually monitor and periodically and electronically record an environmental condition.

34. The method of claim 24 wherein collecting the environmental exposure data  
5 associated with the first set of electronic components comprises using an environmental condition recorder to automatically record environmental condition data.

35. The method of claim 24 wherein the environmental condition recorder comprises:  
a sensing element responsive to an environmental condition;  
10 a memory storage unit in electronic communication with the sensing element and adapted to store environmental condition data sensed by the sensing element; and  
a processing unit in electronic communication with the sensing element and the memory storage unit.

15 36. The method of claim 35 wherein the processing unit is adapted to collect environmental condition exposure data by periodically sampling the sensing element and electronically storing the sample in the memory storage unit.

20 37. The method of claim 35 wherein the processing unit is adapted to evaluate whether each electronic component of the first set is suitable for exposure to conditions associated with securing a second electronic component to the circuit board by evaluating the sample, stored in the memory storage unit.